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TITLE: Linear lens and method for concentrating radiant energy and multiplying phosphor luminance output intensity

Detailed Description Text (14):

The phosphor emission energy in the device [14] is trapped in six waveguide zones with three different wavelength spectrums. If a single dominate wavelength is desired, a diffuser ring (18), as shown in FIG. 2a, made of the waveguide core material with a outer circumferential layer of cladding material and containing F-Dye #2 and F-Dye #1, is placed at the end of the waveguide (14) or array (17) to convert the shorter wavelengths to the longer wavelength of the F-Dye #1. For markers to have good visibility, the final fluorescence emission should be under 610 nm to fall favorably within the human eye's spectral response spectrum.

Detailed Description Text (45):

The blue-green photon flux initiates a fluorescent cascade in waveguide [203], FIG. 4, that starts with fluorescent dye [70], then fluorescent dye [80] in the next coaxial and co-centered waveguide [202], then fluorescent dye [90] in waveguides [203] and [201], then fluorescent dye [100] in waveguide [202] in which up to thirty percent of the blue-green flux is trapped in the waveguides [201], [202] and [203] by fluorescent scatter. The trapped energy has four different wavelengths with the longest in the deep red or near infrared. Again, a diffuser [18] FIG. 2, can be used to convert the trapped energy into the longer wavelength of the last fluorescent dye [100]. Four dyes are described, but fewer or more dyes can be used: The key to high trapping efficiencies is to prevent the rescattering of the photons that each fluorescent dye [70, 80, 90, 100] has scattered into angles of incident allowing trapping in the waveguide cores.